AMERICAN PSYCHOLOGICAL ASSOCIATION
TRAUMA PSYCHOLOGY
AMERICAN PSYCHOLOGICAL ASSOCIATION

Psychological Trauma:
Theory, Research, Practice, and Policy

ISSN: 1942-9681

2022, Vol. 14, No. 4, 642–652
https://doi.org/10.1037/tra0001073

The Effectiveness of PTSD Treatment for Adolescents in the Juvenile Justice System: A Systematic Review

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Objective: The objective of this study was to systematically review existing empirical evidence on the effectiveness of trauma-specific treatment for justice-involved adolescents and evaluate the impact of the interventions on the reduction of posttraumatic stress disorder (PTSD) symptoms, co-occurring mental health symptoms, and juvenile justice–related outcomes. ***Method:*** A systematic literature search was conducted using a four-step process. Studies were included if they used a manualized, trauma-specific treatment with at least one control or comparison group and a sample comprised exclusively of justice-involved adolescents. ***Results:*** In total, 1,699 unique records were identified, and 56 full-text articles were reviewed, of which 7 met the criteria for inclusion. Trauma-specific interventions led to a decrease in PTSD symptoms compared with a control group in four of seven studies, and two studies also demonstrated a reduction in trauma-related depressive symptoms. Finally, juvenile justice–related outcomes were measured in only four studies, with one study finding moderately reduced rates of delinquent behavior and recidivism following trauma-specific treatment. ***Conclusions:*** The results from this systematic review suggest that trauma-specific treatment interventions have promising effects for justice-involved adolescents. However, the results reveal a dearth of quality intervention research for treating youths with histories of trauma in the justice system. Significant gaps in the literature are highlighted, and suggestions for future directions are discussed.

Clinical Impact Statement

This is one of the first known systematic reviews to focus exclusively on the effectiveness of trauma-specific treatments for youths in the juvenile justice system. Trauma-specific treatments are critical to trauma-informed justice practices, yet minimal evidence exists about their effectiveness with this population. Among the seven included studies, trauma-specific treatments significantly reduced PTSD symptoms, co-occurring mental health symptoms, and justice-related outcomes. These findings suggest that trauma-specific interventions can be effectively adapted for use with adolescents in the justice system and improve outcomes beyond PTSD. More research is needed to establish an evidence base across the justice continuum and develop guidelines for the implementation of effective treatments.

Keywords: trauma-specific treatment, juvenile justice, adolescents, co-occurring outcomes, systematic review

Supplemental materials: https://doi.org/10.1037/tra0001073.supp

Rates of trauma exposure and posttraumatic stress disorder (PTSD) among youths in the juvenile justice (JJ) system far exceed those found in community samples (Abram et al., 2004; Dierkhising et al., 2013). Numerous studies have established the potential impact of childhood trauma exposure, including adverse mental health and behavioral outcomes (Gardner et al., 2019; Green et al., 2005; Johnsona et al., 2002). For justice-involved youth, a history of trauma exposure is also associated with an

This article was published Online First August 19, 2021.
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We thank Fei Guo for her contribution to this article.

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increased risk of negative legal outcomes (Lansford et al., 2007; Riggs Romaine et al., 2011).

Recognition of the high rates of trauma exposure among justice-involved youths has spurred calls to improve the JJ system's response (Attorney General's National Task Force on Children Exposed to Violence, 2012; National Council of Juvenile and Family Court Judges, 2015). A widely cited recommendation for achieving this goal is the implementation of evidence-based trauma-specific mental health treatment as the standard of care (Branson et al., 2017). Although we have advanced our understanding of treatment effectiveness for adolescent PTSD, our knowledge of which treatments are effective for adolescents involved in the JJ system remains limited. For the widespread implementation of evidence-based trauma-specific mental health treatment to occur, it is necessary to (a) demonstrate that trauma-specific treatments improve outcomes such as recidivism, substance use, and aggressive behavior and (b) determine which interventions are effective for youths in JJ settings (Ford et al., 2014).

Trauma-Specific Treatment for Adolescents

Several published reviews have established the effectiveness of therapeutic interventions for treating PTSD and other trauma-related mental health problems among adolescents in community settings (Black et al., 2012; Dorsey et al., 2011; Schneider et al., 2013). Cognitive–behavioral therapy (CBT) interventions in particular have been found to be effective in reducing PTSD symptoms (Gillies et al., 2013) and trauma-related internalizing and externalizing symptoms (Kowalik et al., 2011) compared with no treatment or supportive therapy. However, PTSD treatment reviews have included few studies conducted with youths who are currently involved in the juvenile justice system.

Some studies have demonstrated improved outcomes following trauma-specific treatment with at-risk youths who may be similar to youths with ongoing justice involvement, such as youths in foster care (Weiner et al., 2009). Additionally, a randomized trial of Trauma Affect Regulation: Guide for Education and Treatment (TARGET; Ford, 2015) found reduced PTSD symptoms and improved emotion regulation among adolescent girls, many of whom had prior juvenile arrests (Ford et al., 2012). In a review focusing on youths with active JJ involvement, Kumm et al. (2019) examined the impact of mental health interventions on internalizing disorders, including PTSD, among youths in secure JJ facilities. In that study, randomized and quasi-experimental studies found no significant treatment effects, whereas single-group studies showed significant, consistent effects. The authors highlighted the dearth of quality intervention research for youths in JJ settings, but no conclusions were drawn with regard to the effectiveness of individual interventions.

Although interventions such as CBT have well-established efficacy for reducing adolescent PTSD symptoms, their impact on comorbid outcomes common among justice-involved youth, including aggression, substance use, and recidivism, remains virtually unexplored. A review of PTSD treatment trials for youths with histories of child maltreatment found only two studies that met inclusion criteria and focused on comorbid outcomes such as aggressive behavior (Leenarts et al., 2013). However, only one of the two studies reported outcomes related to youth aggression (Wolfe et al., 2003). Several treatments designed for use with justice-involved youths have also received widespread support for their effectiveness in improving justice-related outcomes (Baldwin et al., 2012; Sawyer & Borduin, 2011), yet their efficacy with youths suffering from traumatic stress is unclear. Widely cited meta-analyses of effective interventions for justice-involved youths have not specifically examined the effectiveness of therapeutic interventions designed to address traumatic stress symptoms (Evans-Chase & Zhou, 2014; Landenberger & Lipsey, 2005; Lipsey, 2009). As such, a critical gap exists in the availability of treatment focused on both specific mental health needs and delinquency risk reduction. The risk-need-responsivity (RNR) model (Andrews et al., 1990) provides a useful framework for matching interventions with a youth's level of risk of reoffending (i.e., risk), factors that can be changed to reduce risk level (i.e., needs), and characteristics affecting treatment amenability (i.e., responsivity). Prior findings demonstrate that matching treatments based on the RNR model can reduce youth recidivism (Vieira et al., 2009; Vitopoulos et al., 2012). Baglivio et al. (2021) found that adolescents in juvenile placements with a history of extensive trauma exposure had higher odds of reoffending; however, when youths received matched services at the appropriate dosage, both low- and high-trauma-exposure groups demonstrated a reduced risk for recidivism.

The Current Study

Evidence-based trauma-focused treatments are a critical component of trauma-informed JJ practice, yet little is known about their effectiveness in treating PTSD and co-occurring symptoms among youths with justice involvement. This represents a significant gap in knowledge. The primary aim of this study was to summarize the empirical evidence on the effectiveness of trauma-specific treatment interventions for reducing PTSD symptoms and co-occurring outcomes. This narrative synthesis of the literature will identify significant gaps in the evidence base and recommendations for future research. The risk of bias for individual studies will also be assessed in order to account for systematic errors that could influence the conclusions drawn in this review (Higgins & Altman, 2008).

Methods

Study Protocol

The first author (CB) developed the study protocol in accordance with the PRISMA-P 2015 guidelines for systematic review and meta-analysis protocols (Shamseer et al., 2015). The complete study protocol was registered with PROSPERO on June 3, 2016, and can be accessed at http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42016039858.

Literature Search Strategy

The search for eligible studies was conducted using a four-step process. First, in July 2016, the fourth author (RR) searched five databases (PsycINFO, PubMed, PILOTS, Cochrane Central Register of Controlled Trials, and National Criminal Justice Reference Service [NCJRS]) using the following search terms: *trauma** OR *PTSD* OR *posttraumatic stress* OR *post traumatic stress*) AND (*treatment* OR *intervention* OR *therapy* OR *psychotherapy*) AND

(*delinquent** OR *juvenile justice* OR *adjudicated*). The titles and abstracts of articles obtained in the electronic searches were independently reviewed by the first (CLB) and fourth (RR) authors, and those articles selected for inclusion by either reviewer were subjected to a full-text review. Disagreements about inclusion during the full-text review were discussed and resolved between the two reviewers, with the second author (CEB) serving as the deciding vote when disagreements were not resolved by discussion. In the second phase, the fourth author conducted a "cited by" search of included publications in Google Scholar. In the third phase, the first and fourth authors independently reviewed the reference lists of all included publications. Any additional publications located in the "cited by" or reference list searches were reviewed in the same manner as those identified in the electronic searches. During the final step of the search process, unpublished or ongoing studies that might be suitable for inclusion were solicited through a posting on the National Child Traumatic Stress Network Justice Consortium listserv and through a review of the National Institutes of Health (NIH) electronic record of currently funded projects. The database search process was repeated in April 2020 by the third author (EW) to identify any studies that had been published since the original search was conducted.

Inclusion Criteria

Studies were eligible for inclusion if they (a) evaluated the effectiveness of a manualized treatment with a primary focus on addressing trauma or PTSD; (b) had a sample comprised entirely of adolescents (up to age 21) with current JJ system involvement (e.g., detained, incarcerated, awaiting resolution of a criminal court case, on probation, etc.); (c) included at least one control or comparison group (i.e., no single-group trials or case reports); and (d) were published in English in a peer-reviewed journal, book, or unpublished dissertation. Given the current study's focus on treatment effectiveness with youths in the JJ system, we excluded studies with samples of youths with conduct problems but no current JJ involvement or self-reported delinquency only. Studies that did not include any participants under the age of 18 were also excluded.

Evaluation of Bias

The methodological quality of each included study was evaluated independently by the first and second authors using the Cochrane Collaboration checklist (Higgins & Altman, 2008), which assesses for risk of bias within six areas: generation of a random sequence for allocating participants into groups, blinding of research staff and participants, incomplete outcome information, selective reporting of outcomes, concealment of allocation, and other issues that impact methodological quality. Studies were rated as low, high, or unclear within each area of risk, and disagreements were resolved by discussion.

Data Extraction and Coding

Two authors independently extracted data from each of the included articles from both searches using a standardized codebook and data form. Extracted, coded, and analyzed variables included characteristics of the study design, sample size (total, treatment and comparison/control groups), participant demographics, number of participants excluded and reasons for exclusion, stage of justice system involvement, type and details of trauma-informed treatment utilized, treatment setting, outcome of treatment-fidelity assessment (if assessed), type and details of comparison/control condition, outcomes (type, measurement, source, means, standard deviations, effect sizes), and details of follow-up. A complete list of extracted variables is available from the first author.

Data Analysis

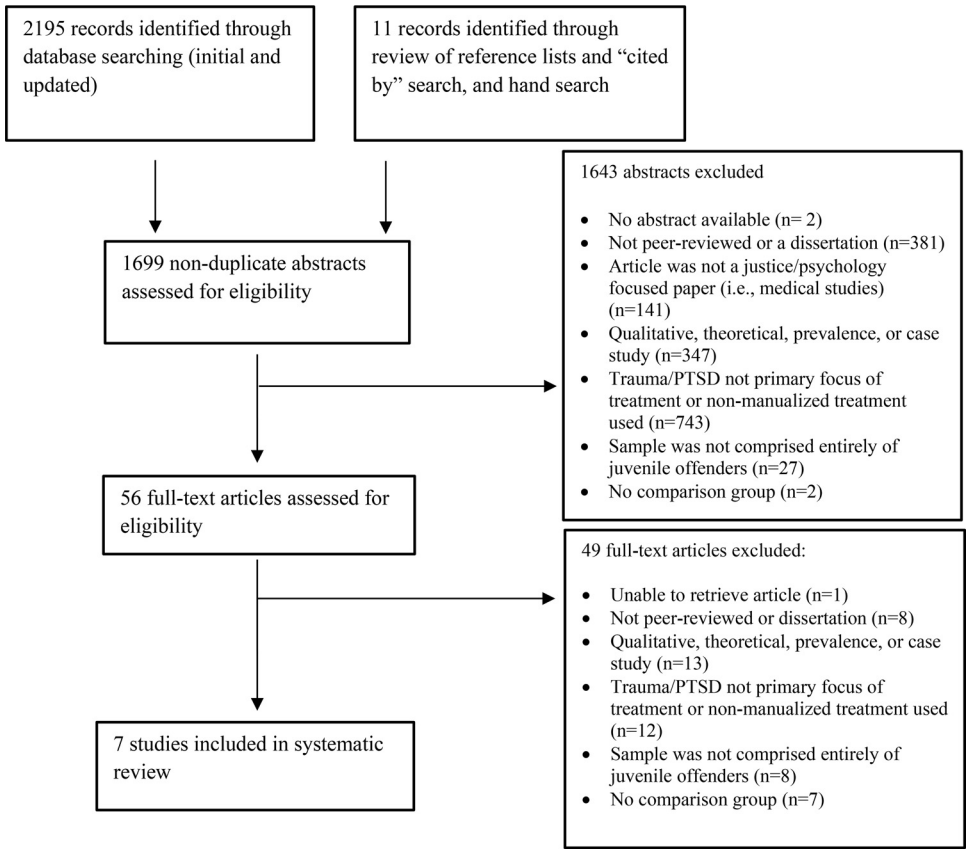
The level of posttraumatic stress symptoms was the primary outcome evaluated across studies. Secondary outcomes included depressive symptoms and rates of rearrest, as well as variables specific to JJ residential facilities (e.g., rates of seclusion and/or room confinement, disciplinary incidents while detained or incarcerated). The original intent of the current study was to conduct a meta-analysis to evaluate the effect sizes of the interventions on the primary and secondary outcomes across all included studies. However, the limited number of eligible studies and inconsistent reporting of outcomes within studies precluded us from using formal meta-analytic procedures. As an alternative, descriptive statistics are provided for the characteristics and outcomes of the included studies, and the data were systematically synthesized in narrative form. Additionally, whenever possible, individual effect sizes for outcomes within each study were calculated and are reported using Cohen's *d,* which expresses the difference between the mean change scores (pre- minus post-) in the treatment and comparison groups in units of the common (pooled) standard deviation of the outcome at baseline (Cohen, 1998; McGough & Faraone, 2009). When a study lacked enough information to calculate an effect size for a particular outcome, attempts were made to contact the authors to obtain more detailed findings.

Results

Results of Literature Search

In total, 1,699 unique records were identified during our literature search, and 1,643 of those records were excluded after an initial screening. A full-text review of the remaining 56 records resulted in the exclusion of 49 additional records. Of those 49 excluded records, 7 did not include a comparison or control group; 8 did not focus exclusively on youths with current, formal contact with the juvenile or criminal justice system; 13 were not quantitative studies; 12 did not include trauma or PTSD as the primary focus of treatment or used a nonmanualized treatment; 1 article we were unable to retrieve; and 8 were not peer-reviewed articles or a dissertation. This resulted in seven studies with a total of 655 subjects. Interrater agreement for the July 2016 article selection was good (κ = .703) in Round 1 (initial screening) and moderate (k = .521) in Round 2 (full-text review). The repeated database search in April 2020 yielded excellent interrater agreement for article selection in Round 1 (k = .848, n = 217) and fair agreement in Round 2 (k = .273, n = 20). A detailed summary of our literature search results can be found in Figure 1.

Figure 1
Flowchart of Article Search and Selection



Risk of Bias

Table S1 in the online supplemental materials reports the risk of bias for each of the included studies. All of the included studies were deemed to be at high risk of bias on at least one of the six categories. Notably, three of the six studies were at high risk of bias for incomplete outcome reporting, which limited or precluded our ability to calculate reliable effect sizes. Additionally, almost half of the studies were deemed to be at high risk for selective reporting, which warrants caution when interpreting those results.

Study Characteristics

All included studies were peer-reviewed journal articles, and 57% were published within the last 10 years. All studies took place in the United States, with more than half in the Northeast (Ford & Hawke, 2012; Greenbaum & Javdani, 2017), South (Ovaert et al., 2003), and West (Smith et al., 2012) and the remaining studies located in the midwestern region (Ahrens & Rexford, 2002; Marrow et al., 2012; Raider). Studies were either randomized controlled trials (RCTs; Ahrens & Rexford, 2002; Greenbaum & Javdani, 2017; Raider et al., 2008; Smith et al., 2012) or quasi-experimental with a comparison group (Ford & Hawke, 2012; Marrow et al., 2012; Ovaert et al., 2003), and all utilized samples of convenience. Five of the seven studies aimed to evaluate the effectiveness of treatment for specifically reducing traumatic stress symptoms, one study (Greenbaum & Javdani, 2017) aimed to evaluate the treatment's impact on trauma-related mental health outcomes, and the remaining study (Ford & Hawke, 2012) aimed to evaluate the effectiveness of treatment for reducing disciplinary actions in detention and rates of rearrest following youths' release. Four of seven studies (57%; Ahrens & Rexford, 2002; Marrow et al., 2012; Ovaert et al., 2003; Raider et al., 2008) also assessed for co-occurring clinical outcomes (e.g., anxiety, depression), less than half (Ford & Hawke, 2012; Marrow et al., 2012; Raider et al., 2008) of the studies included outcomes related to behavior in the JJ setting (e.g., disciplinary actions, seclusion), and two studies (33%; Ford & Hawke, 2012; Smith et al., 2012) assessed outcomes related to JJ involvement (e.g., rearrest, self-reported delinquent behavior).

In the studies specifically examining traumatic stress symptoms as an outcome, baseline and posttreatment outcomes were assessed within an average of 18.4 weeks (range = 12–52 weeks) from pre- to postassessment. PTSD symptoms were assessed using the UCLA PTSD-RI (Marrow et al., 2012; Ovaert et al., 2003), the combined subscales of the PTSD Symptom Scale-Self Report (PSS-SR) and combined Intrusion and Avoidance subscales of the Impact of Events Scale (IES; Ahrens & Rexford, 2002), the Trauma Symptom Checklist for Children (TSCC; Raider et al., 2008), or the TSCC combined with subscales from several other measures (Smith et al., 2012). However, although five studies

assessed for trauma exposure and/or PTSD symptoms posttreatment, only three of those studies (Ahrens & Rexford, 2002; Marrow et al., 2012; Ovaert et al., 2003) reported separate baseline and posttreatment PTSD symptom scores. Ovaert et al. (2003) also included a follow-up assessment at 6 weeks posttreatment. In the remaining studies, mental health outcomes were assessed at baseline and at 2-week intervals during the intervention (Greenbaum & Javdani, 2017), behavior in the facility was assessed daily and at 14 days postadmission using administrative data (Ford & Hawke, 2012), and rearrest was assessed at 6 months postrelease (Ford & Hawke, 2012). Only two studies (Ford & Hawke, 2012; Greenbaum & Javdani, 2017) included participants from multiple sites, and none of the studies included information on any adverse effects of treatment.

All studies used a manualized treatment intervention with a primary focus on addressing traumatic stress symptoms. Half (Ahrens & Rexford, 2002; Ford & Hawke, 2012; Marrow et al., 2012) utilized a previously established intervention (TARGET, CPT), whereas the remaining studies modified or adapted an existing treatment (structured group therapy [Ovaert et al., 2003]; structured sensory therapy [SITCAP-ART; Raider et al., 2008]), combined treatments; multidimensional treatment foster care [MTFC; Smith et al., 2012]), or piloted a new treatment (WRITE-ON [Greenbaum & Javdani, 2017]). Four studies utilized a standalone group format to deliver the intervention (Ahrens & Rexford, 2002; Ford & Hawke, 2012; Greenbaum & Javdani, 2017; Ovaert et al., 2003), with the remaining studies utilizing both group and individual treatment (Raider et al., 2008); individual treatment with a family treatment component (Smith et al., 2012); or a combination of group treatment for youth, training for staff, and modification of the facility environment (Marrow et al., 2012). Interventions for youths were delivered by mental health professionals (Ahrens & Rexford, 2002; Ovaert et al., 2003; Raider et al., 2008; Smith et al., 2012), including the model developer in one study (Ovaert et al., 2003); front-line detention staff (Ford & Hawke, 2012; Marrow et al., 2012); and trained graduate students (Greenbaum & Javdani, 2017). Five of seven studies (71%) reported information about the type of training provided to treatment providers, including training and certification in the treatment model only (Raider et al., 2008); training in the treatment model plus ongoing supervision and consultation from the model developers (Ford & Hawke, 2012); and a combination of training, including psychoeducation about trauma, trauma-informed skills for group therapy, training in the treatment model, and ongoing supervision and consultation (Greenbaum & Javdani, 2017; Marrow et al., 2012). Service providers' fidelity to the treatment model was only assessed in three of seven studies (43%; Ford & Hawke, 2012; Greenbaum & Javdani, 2017; Raider et al., 2008). All studies used a comparison or control group, which was either waitlist (Ahrens & Rexford, 2002; Ovaert et al., 2003; Raider et al., 2008), treatment as usual (Ford & Hawke, 2012; Marrow et al., 2012; Smith et al., 2012), or a support group (Greenbaum & Javdani, 2017). Additional information about study characteristics can be found in Tables S2 and S3 in the online supplemental materials.

Sample Characteristics

There were 655 participants across studies, with sample sizes in each study ranging from 23 to 394 participants (mean [*M*] = 93.57, standard deviation [*SD*] = 133.51). The majority of participants across studies were male (82.3%; range = 0–100%); two studies included only male participants (Ahrens & Rexford, 2002; Ovaert et al., 2003), and one study included only female participants (Smith et al., 2012). Ages across studies ranged from 11 to 19 (*M* = 15.76, *SD* = 1.09). More than half of all participants were Black (38.3%) or Hispanic (25.4%), and 35.1% of participants were White. No information about the socioeconomic status of participants was reported in any study.

All participants in the included studies were residing in out-of-home placement settings pursuant to juvenile delinquency cases: Six of the seven studies (86%; Ahrens & Rexford, 2002; Ford & Hawke, 2012; Greenbaum & Javdani, 2017; Marrow et al., 2012; Ovaert et al., 2003; Raider et al., 2008) included youths who were incarcerated or detained in a JJ facility, and the remaining study (Smith et al., 2012) consisted of JJ-involved girls residing in a treatment foster care setting. Only three of the seven studies (Ahrens & Rexford, 2002; Ford & Hawke, 2012; Marrow et al., 2012) provided information on participants' criminal charges, which included felonies, misdemeanors, and status offenses. No additional information was provided about participants' JJ history (e.g., number of prior arrests, age of first arrest, previous incarceration).

Four of the seven studies (Ahrens & Rexford, 2002; Ford & Hawke, 2012; Marrow et al., 2012; Raider et al., 2008) reported prior traumatic experiences: In two studies (Ford & Hawke, 2012; Marrow et al., 2012), the large majority of youths reported experiencing at least one traumatic event (66.67% and 100%, respectively), and in the remaining two studies, between 33% (Ahrens & Rexford, 2002) and 75% (Raider et al., 2008) of youths reported exposure to multiple traumatic events. Four of seven (Ahrens & Rexford, 2002; Ford & Hawke, 2012; Marrow et al., 2012; Raider et al., 2008) studies also included information about the type of traumatic event(s) experienced by participants. In two studies (Ahrens & Rexford, 2002; Ovaert et al., 2003), 100% of the youths met the criteria for a PTSD diagnosis, and in a third study (Ford & Hawke, 2012), 21% of the youths met the criteria for full or partial PTSD. The remaining four studies (Greenbaum & Javdani, 2017; Marrow et al., 2012; Raider et al., 2008; Smith et al., 2012) did not report information on PTSD diagnosis. Only one study (Ahrens & Rexford, 2002) reported information on comorbid diagnoses at baseline. Table S4 in the online supplemental materials provides further information about sample characteristics.

Primary Outcome: PTSD Symptoms

The primary outcome of PTSD symptoms was assessed in six of the seven studies (Ahrens & Rexford, 2002; Greenbaum & Javdani, 2017; Marrow et al., 2012; Ovaert et al., 2003; Raider et al., 2008; Smith et al., 2012), with only five of those six studies (Ahrens & Rexford, 2002; Greenbaum & Javdani, 2017; Marrow et al., 2012; Ovaert et al., 2003; Smith et al., 2012) providing enough information about symptom scores at pre- and posttreatment to calculate an effect size. In four of those studies, the trauma-specific intervention led to a significant decrease in PTSD symptoms as compared with the control group, with treatment effect sizes varying widely from small (d = 0.1 in Marrow et al. [2012; TARGET]) to medium (d = 0.5 in Ovaert et al. [2003; CBT group]), to large (d = 0.96–1.2 in Ahrens and Rexford [2002;

CPT]). It should be noted that in the Ovaert et al. (2003) study, the effect size was calculated using the same baseline means for both treatment and control groups because no pretest data were available for the control group. As a result, the effect size in that study is largely unreliable. In the remaining study (Raider et al., 2008), SITCAP-ART demonstrated significantly reduced avoidance symptoms from pretest to posttest for the treatment group ($F = 5.087$, $p = .033$). Avoidance was the only PTSD symptom included in the findings, and no comparisons between the treatment and control groups were reported on the outcome of PTSD symptoms.

In the Smith et al. (2012) study, MTFC demonstrated a moderate effect on PTSD symptoms, as well as anxiety and depressive symptoms ($d = 0.48$; MTFC). However, the collapsed nature of this outcome variable made it difficult to determine the impact on PTSD symptoms specifically. Finally, the WRITE-ON intervention (Greenbaum & Javdani, 2017) demonstrated a small negative effect on shame ($d = 0.19$) and negative affect ($d = 0.23$), both of which fall within the "negative cognitions and mood" criteria for PTSD. More information about the primary outcome can be found in Table S3 in the online supplemental materials.

Secondary Outcomes: Co-Occurring Mental Health Symptoms and/or Disorders

Four of the seven studies (Ahrens & Rexford, 2002; Marrow et al., 2012; Ovaert et al., 2003; Raider et al., 2008) evaluated the impact of trauma-specific treatment on symptoms of co-occurring mental health disorders or symptoms, including depression (Ahrens & Rexford, 2002; Marrow et al., 2012, Ovaert et al., 2003; Raider et al., 2008), anxiety (Marrow et al., 2012; Ovaert et al., 2003; Raider et al., 2008), general internalizing behaviors (Raider et al., 2008), and somatic complaints (Raider et al., 2008). One study (Greenbaum & Javdani, 2017) also examined the impact of the intervention on resilience and positive affect. In two studies, both CPT (Ahrens & Rexford, 2002) and TARGET (Marrow et al., 2012) demonstrated a large effect on symptoms of depression ($d = 0.7$ and $d = 0.81$, respectively), but the effect size associated with TARGET was due in part to an increase in depressive symptoms in the control group from pre- to posttest. Outcomes were also reported for the impact of TARGET on symptoms of anxiety, including generalized anxiety disorder, panic disorder, separation anxiety, and social anxiety, with no significant differences between treatment and control groups on these outcomes following the intervention. The WRITE-ON intervention (Greenbaum & Javdani, 2017) demonstrated a moderate negative effect on positive affect ($d = –0.61$).

Effect sizes could not be calculated in the remaining two studies (Ovaert et al., 2003; Raider et al., 2008) because these studies did not report any comparisons between the treatment and control groups from pre- to posttest. However, Raider et al. (2008) reported that youths receiving SITCAP-ART had significantly decreased anxiety and depressive symptoms from pre- to posttest ($F = 5.250$, $p = .031$), as well as decreased overall internalizing behaviors ($F = 5.024$, $p = .034$). Ovaert et al. (2003) reported that there were no significant differences from pre- to posttest for youths who received CBT.

Secondary Outcomes: JJ-Related Outcomes

JJ outcomes were evaluated in four of seven studies (Ford & Hawke, 2012; Marrow et al., 2012; Ovaert et al., 2003; Smith et al., 2012) and included behavioral problems while residing in a JJ facility (Ford & Hawke, 2012; Marrow et al., 2012; Ovaert et al., 2003), frequency and time spent in seclusion or room confinement (Ford & Hawke, 2012; Marrow et al., 2012), rate of restraints of youths by JJ staff (Marrow et al., 2012), and postrelease delinquent behaviors and/or official arrests (Ford & Hawke, 2012; Smith et al., 2012).

At least two studies in secure juvenile residential facilities found evidence for a reduction in disciplinary incidents (Ford & Hawke, 2012) and threatening behaviors by youths (Marrow et al., 2012) following the TARGET intervention. TARGET participants also experienced lower rates of seclusion (Ford & Hawke, 2012) and restraint (Marrow et al., 2012). However, not enough information was provided to calculate effect sizes for this reduction, and no comparisons between treatment and control groups were reported. Additionally, in the Ovaert et al. (2003) study, youths receiving CBT evidenced fewer incident reports at 3 months postadmission ($M = 6.17$, $SD = 5.03$) compared with the control group ($M = 8.97$, $SD = 8.62$). However, no information was provided regarding the number of behavioral incidents for either group at pretest, thereby precluding the calculation of a true comparison between the treatment and control groups.

Two studies (Ford & Hawke, 2012; Smith et al., 2012) examined the impact of a trauma-specific intervention on recidivism following release from a JJ facility. There were no significant differences between youths who received TARGET and those who received treatment as usual in rates of arrest within 6 months after release ($\beta = .03$, $p = .70$; Ford & Hawke, 2012). In contrast, youths who received adapted MTFC had lower rates of delinquency at 12 months postbaseline ($\beta = –.48$, $p < .05$), and the intervention evidenced a moderate impact on recidivism ($d = 0.44$; Smith et al., 2012). However, Ford and Hawke (2012) used official arrests as the sole outcome for recidivism, whereas the measure of posttreatment delinquency used by Smith et al. (2012) was a collapsed variable including official arrests, self-reported and caregiver-reported delinquent behavior, and number of days in a JJ facility. Additionally, youths in the MTFC treatment group (Smith et al., 2012) received treatment and specialized foster care placement for approximately 9 months, plus an additional 3 months of intensive services following family reunification. As a result, these youths may still have been receiving some form of treatment during the period of assessment for recidivism. In contrast, youths only received the TARGET intervention (Ford & Hawke, 2012) while residing in a juvenile detention facility, and the intervention did not continue during the time that recidivism was assessed.

Discussion

The current study is one of the first systematic reviews to evaluate the effectiveness of PTSD treatment with youths involved in the JJ system. One of the most notable findings of this review is that despite an exhaustive search, there were a limited number ($N = 7$) of rigorous empirical studies that have examined the use of trauma-focused or trauma-specific treatments with this population. Of these seven studies, few provided enough information to

calculate an effect size for most outcomes. Furthermore, each of the seven studies had methodological shortcomings that included at least one potential source of bias. However, it is notable that in those studies where an effect size could be calculated, trauma-specific treatments had a significant impact on youth PTSD symptoms, co-occurring mental health symptoms, and JJ-related outcomes.

PTSD Symptoms

The results of this study indicated that at least four manualized treatments (TARGET, MTFC, CPT, WRITE-ON) led to a significant decrease in PTSD symptoms among justice-involved youths compared with a control group (Ahrens & Rexford, 2002; Greenbaum & Javdani, 2017; Marrow et al., 2012; Smith et al., 2012). Although the effect sizes varied across interventions, likely due to variability in the treatment models and measurement instruments used across studies, this finding is consistent with past research demonstrating the effectiveness of CBT and other CBT-based interventions for treating traumatic stress among adolescents in the community (Gillies et al., 2013; Kowalik et al., 2011), as well as system-involved youths in nonjustice settings (Cohen & Mannarino, 2008; Ford et al., 2012). This finding suggests that trauma-specific treatments have the potential to be adapted and used effectively with justice-involved youths and provides further evidence of the importance of considering such interventions when delivering mental health services to youths in justice settings.

Given the increased potential for trauma triggers and environmental stressors in detention and correctional settings (Dierkhising et al., 2014), many of which present barriers to effective treatment, the significant improvements in PTSD symptoms attributed to the CPT and TARGET interventions (Ahrens & Rexford, 2002; Marrow et al., 2012) are particularly promising findings. To the authors' knowledge, these are the only two studies to utilize both treatment and comparison groups to evaluate the impact of a manualized trauma-specific treatment on detained or incarcerated adolescents' PTSD symptoms. However, it is important to note that in the Marrow et al. (2012) study, the intervention included a staff/milieu component. This may have facilitated the treatment's effectiveness, so it is difficult to determine the sole impact of the treatment itself.

Co-Occurring Mental Health Disorders

With regard to reduction in mental health disorders or symptoms that co-occur with PTSD symptoms (e.g., depression, anxiety, general internalizing symptoms, somatic complaints), the reviewed literature produced mixed results. Two studies (Ahrens & Rexford, 2002; Marrow et al., 2012) demonstrated large effect sizes for depression following trauma-specific treatments (CPT and TARGET), but the effect size associated with the TARGET intervention may be confounded by the increase in depressive symptoms in the control group from pre- to posttest. However, despite study limitations, the significant impact of CPT and TARGET on depressive symptoms suggests that trauma-specific treatment may mitigate co-occurring symptoms in justice-involved adolescents. These findings are consistent with past literature identifying depression as a correlate of PTSD, particularly in justice-involved samples (Dixon et al., 2005; Kerig et al., 2009). In a sample of incarcerated adolescents, Kerig et al. (2009) found a complete mediation effect of PTSD symptoms between traumatic event exposure and mental health problems, namely, depressed and anxious symptoms. Therefore, the findings from the present systematic review support the notion that targeting traumatic reactions may result in a simultaneous reduction of depressive and other trauma-related symptoms. Of note, although substance use disorders (SUDs) are prevalent among justice-involved youths (Welty et al., 2017) and highly comorbid with PTSD in adolescents overall (Carliner et al., 2017), none of the studies included SUD as an outcome variable.

Juvenile Justice–Related Outcomes

Notably, only four of the seven studies evaluated any JJ-related outcomes, and only two of those addressed recidivism. This is important for two reasons. First, numerous studies have documented the significant associations between PTSD and delinquent behavior, such that trauma reactions can serve as a catalyst for youth involvement in the justice system (Ford et al., 2006; Greenwald, 2002; Kerig & Becker, 2010). Therefore, targeting adolescents' trauma reactions may reduce maladaptive behaviors, thereby leading to a reduction in the negative outcomes associated with JJ involvement (i.e., criminogenic needs). Guided by the RNR model, it is recommended that to reduce recidivism, treatment should be matched to youths' individualized risk, need, and responsivity factors. Conceptualizing PTSD symptoms as an individual responsivity factor can help tailor appropriate interventions that maximize a youth's abilities and learning styles (Andrews et al., 1990; Vieira et al., 2009).

Second, JJ stakeholders and mental health providers in justice settings have divergent but related primary objectives. Whereas mental health providers are focused on symptom reduction, JJ professionals' principal concern is to create safer communities by measuring four performance outcomes: "changes in the youth crime rate; juvenile offender recidivism after the age of majority; one year, postsupervision reoffending; and in-program reoffending" (Bazemore, 2006, p. 16). Therefore, demonstrating that PTSD treatments are effective at improving justice-specific outcomes is essential to increase buy-in from JJ agencies. Enthusiastic agencies may increase allocations of time and resources to support trauma-focused treatment programs, making them easier to implement and more likely to succeed.

In those studies examining the impact of trauma-specific treatment on recidivism following release from a JJ facility (Ford & Hawke, 2012; Smith et al., 2012), there were conflicting results that may be attributed to the authors' distinct operationalizations of recidivism (e.g., only official arrests vs. official arrests plus self- and caregiver-reported delinquency behavior). Additionally, the significant findings in Smith et al.'s (2012) study could be partially explained by the continuation of treatment that participants received during the period of assessment for recidivism, which underscores the importance of extending trauma-focused treatment beyond an adolescent's stay in detention. Although extensive research has supported the association between PTSD symptoms and delinquency (e.g., Ford et al., 2006), few studies have investigated the effect of trauma-focused treatment on reducing future offending. Furthermore, there is a dearth of research on the most effective types of treatments or the timing of those treatments. As

such, these findings should be considered an important contribution to understanding the utility of trauma-focused treatment both in and beyond detention settings.

Limitations

Several limitations related to the quality of the literature emerged during this systematic review. Therefore, although the results contribute significantly to the field, they must be interpreted with caution. One limitation observed across the seven studies was study methodology. All of the studies were at high risk of bias on at least one of six categories, including incomplete outcome reporting. Most studies had small sample sizes (N range = 23–74), and all used samples of convenience. Only two studies (Ford & Hawke, 2012; Greenbaum & Javdani, 2017) utilized a multisite design, whereas the others conducted their treatment comparisons at a single site. Notably, none of the studies assessed for adverse events (e.g., symptom exacerbation, attrition, increased aggression) that may have occurred as a result of treatment. Adverse events are particularly important to identify, given the potential impact of utilizing exposure-based treatments in JJ settings where youths may continue to be triggered or retraumatized, as well as the impact of court-ordered trauma-specific treatment on youth outcomes (Ford & Blaustein, 2013; Ford et al., 2014).

Additionally, all of the included studies involved youths residing in out-of-home justice-related placements. Residential placement in a JJ case is at the far end of the justice system continuum, and extant research indicates that the prevalence and severity of mental health diagnoses increase with deeper penetration into the justice system (Wasserman et al., 2010). Thus, the generalizability of the results from the current review to community-based justice settings (e.g., probation, diversion programs, alternatives to detention) is unclear and warrants further exploration.

Concerns related to the intervention and assessment protocols also emerged. Most of the studies included in the present review had short follow-up periods between pre- and posttreatment assessments, which limited the ability to measure the change in youth functioning. The studies ranged in follow-up periods from "immediately following treatment completion" (Raider et al., 2008) to 2 weeks (Ford & Hawke, 2012; Greenbaum & Javdani, 2017), 6 weeks (Marrow et al., 2012; Ovaert et al., 2003), and 12 weeks (Ahrens & Rexford, 2002). Only one study (Smith et al., 2012) used a 1-year follow-up period, which allowed for increased specificity in that study's outcome evaluations. Further, two of the studies did not explicitly measure PTSD symptoms but, rather, collapsed PTSD, depression, and anxiety symptoms into one variable (Smith et al., 2012) or measured other symptoms (i.e., negative affect and shame) that are representative of the "negative cognitions and mood" PTSD symptom cluster (Greenbaum & Javdani, 2017). Although the results from these studies suggest a significant impact of their interventions on PTSD symptom reduction, it is impossible to decipher the unique effect on PTSD given the operationalization of these variables. It is also prudent to consider what training the providers received, in addition to staff fidelity to the interventions across studies. Two studies (Ahrens & Rexford, 2002; Ovaert et al., 2003) did not report on training received, and four studies either did not assess or did not report on fidelity to the intervention (Ahrens & Rexford, 2002; Marrow et al., 2012; Ovaert et al., 2003; Smith et al., 2012). The impact of provider training and consistency in intervention implementation should be measured in future studies because variability in these domains may have significant effects on mental health and justice-related outcomes.

Future Directions and Implications

As the field moves toward incorporating trauma-informed mental health screening, assessment, and treatment at all levels of the JJ system, empirical guidance is critical to determine which treatments should be implemented and for whom, as well as how treatments should be adapted for particular settings. At a minimum, more studies using rigorous designs and sound methodology are needed to investigate PTSD treatment outcomes for this population of youths. The lack of methodologically sound studies may also speak to the difficulty faced by researchers when trying to conducting high-quality studies of treatment effectiveness in JJ settings, including security and operational and logistical challenges within residential facilities, as well as concerns related to the protection of human subjects. This emphasizes the need for more partnerships between academic institutions and JJ agencies. Although best practices for forging such partnerships and effectively implementing treatments in JJ settings require continued exploration, recent findings suggest avenues for bridging the gap between science and practice. Consistent themes emerge related to establishing collaboration and trust between external partners and JJ agencies, developing implementation from the ground up while considering an agency's existing practices, and attending to the culture and climate of the setting. Researchers also emphasize continuous monitoring with data-driven indicators to sustain treatment and ensure quality implementation (Baetz et al., 2019; Young et al., 2006).

Furthermore, considerations of who is providing these treatments (e.g., licensed mental health clinicians or front-line JJ staff) are essential for determining the effective implementation of interventions. The ability to train front-line staff in trauma-informed treatments may enhance the efficacy of implementation (Anderson et al., 2020). Given the lack of available therapists trained in trauma-specific treatment and even fewer numbers working in the justice system, training of front-line staff could increase the ability to reach a greater number of justice-involved adolescents. More studies are also needed to examine the way in which evidence-based treatments could be modified to align with the RNR model and incorporate both trauma-informed and justice-specific components. This focus may aid in addressing the dual goals of improving both PTSD and justice-related outcomes. Future research is also necessary to assess the effectiveness of trauma-specific treatment interventions for youths at various points on the JJ continuum. Given recent initiatives to reduce the use of out-of-home placements (e.g., Mendal, 2011), additional research on the effectiveness of trauma-specific treatment for JJ youths in the community has potential benefits for the field. This future direction is particularly salient to determine if and how trauma-specific treatment may emerge as a preventative measure to reduce the risk of deeper justice involvement.

Finally, although outside the scope of this review, it is important to note that at least two included studies incorporated outcome measures related to resilience and hope (Greenbaum & Javdani, 2017; Marrow et al., 2012). In those studies, the manualized

treatments used (TARGET, WRITE-ON) evidenced a large effect on these outcomes. This suggests that protective factors against mental health symptoms may develop as a result of trauma-specific treatment, and future studies should consider a stronger emphasis on similar outcomes.

Conclusion

Although evidence continues to accumulate that youths in the justice system are disproportionately exposed to violence and other traumatic events, surprisingly little is known about what works to improve PTSD and trauma-related outcomes for this vulnerable population. Over the past decade, mental health screening for traumatic-event exposure and PTSD has become standard practice in JJ settings (Grisso, 2007). However, although routine trauma screening has increased the identification of youths in need of follow-up assessment and intervention, empirical knowledge about effective treatment options for this population across the juvenile justice settings has not kept pace. The results of this review offer encouraging evidence for the effectiveness of using existing trauma-specific treatments with youths in justice settings and highlight the importance of a continued focus on building empirical knowledge within this area.

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*References marked with an asterisk indicate those included in the review.

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Received October 26, 2020
Revision received March 26, 2021
Accepted April 2, 2021 ■